



Trends in daily precipitation extremes in Mainland Portugal, 1941-2007

Fátima E. Santo (1), Isabel de Lima (2), and Alexandre M. Ramos (3)

(1) Institute of Meteorology, Lisbon, Portugal (fatima.coelho@meteo.pt), (2) IMAR – Institute of Marine Research; ESAC/Polytechnic Institute of Coimbra, Portugal (iplima@esac.pt), (3) Environmental Physics Laboratory, Universidad de Vigo, Spain (alexramos@uvigo.es)

Changes in the precipitation climate are expected to be accompanied by variations in the occurrence of extreme events; the impacts on society and the environment makes it mandatory to understand regional specificities. Such modifications in the precipitation regime can be studied by inspecting trends in specific indices defined for daily precipitation; these include threshold indices, probability indices, duration indices and other indices. Despite their simplicity, the indices are currently being used in many studies, facilitating the comparison of results from different studies.

This work explores recent modifications in the occurrence of precipitation extremes in mainland Portugal by analysing trends and variations in selected precipitation indices for different time periods and different seasons; this is used as a tool to understand variations in the intensity and frequency of extreme precipitation events. Data include daily precipitation from 57 climatological weather stations and rain-gauges (IM and INAG network), covering the period 1941-2007.

Results show that there are regional differences in patterns of precipitation trends. For the record period, analyses of annual precipitation indices reveal a decrease of annual precipitation, which seems to be explained mainly by a decrease in the number of wet days and also by a decrease in daily intensity (total precipitation divided by the number of wet days), significant at 5% level. Nevertheless, during the last 30 years, in particular over Southern Portugal, there is an increase in the contribution of extremely wet days (99th percentile) to the annual precipitation. There are marked differences in the results obtained for trends in extreme precipitation depending on the season.